50 Years Ago in CORR

Skeletal Lesions Produced by Aminonitriles

by Ignacio V. Ponseti MD CORR 1957;9:131–144

We highlight this month a report of a number of experiments documenting aminonitriles as the source of lathyrism, a disease known since antiquity and recognized by the early twentieth century to be related to high dietary levels of peas of the genus *Lathyrus* [1]. Earlier workers had related the occurrence of non-skeletal lesions (degeneration of the nervous system associated with

Fig. 3 An 8-week-old rabbit fed stock diet containing 0.2 per cent AAN from 6 weeks of age. This rabbit had bilateral complete slipping of the upper humeral epiphyses. (Reprinted with permission from Ponseti IV. Skeletal lesions produced by aminonitriles. *Clin Orthop Relat Res.* 1957;9:131–144.)

Fig. 7 Sagittal section of the mid-thoracic vertebrae in a 56-day-old rat fed a stock diet containing 0.2 per cent BAPN from 23 days of age. Slipping of one vertebra and loosening of the interspinous ligaments at the level of the slipping can be seen. (Reprinted with permission from Ponseti IV. Skeletal lesions produced by aminonitriles. *Clin Orthop Relat Res.* 1957;9:131–144.)

Fig. 6 Roentgenograms of a 13-week-old rat fed a stock diet containing 50 per cent *Lathyrus odoratus* peas from 4 weeks of age. Note scoliosis, thoracic deformity, subluxation of the shoulders and bowing of the long bones. (Reprinted with permission from Ponseti IV. Skeletal lesions produced by aminonitriles. *Clin Orthop Relat Res.* 1957;9:131–144.)

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spastic paraplegia, pain, hypesthesias) in humans and skeletal lesions (kyphoscoliosis, exostoses, lameness) in animals. Because the disease in humans and animals appeared distinct, and perhaps related to ingestion of different species of Lathyrus peas, others had suggested applying the term lathyrism only to the human condition and odoratism (from Lathyrus odoratus) to the animal condition [2]. Finally, several groups had isolated aminonitriles from peas that produced odoratism. Ponseti and colleagues [1] completed the loop by feeding aminonitriles to growing

animals (rabbits, rats, frogs, chickens), and produced a wide variety of skeletal lesions relating to abnormalities he identified in the growth plates: slipping of the upper femoral epiphysis (Fig. 3) and kyphoscoliosis (Figs. 6, 7). However, the lesions were not limited to the skeleton, but also caused dissecting aneurysm, suggesting interference of the aminonitriles in metabolic pathways involving common structural proteins.

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References

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